# USER MANUAL

## MODEL 2110
### CopperLink Ethernet Booster

CE This is a Class A device and is intended for use in a light industrial (commercial) environment. It is not intended nor approved for use in a heavy industrial or residential environment.

PATTON Electronics Co.

Part# 07M2110-UM
Rev. B
Revised 3/5/10

SALES OFFICE
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ISO 9001 CERTIFIED

An ISO-9001Certified Company

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## 1.0 WARRANTY INFORMATION

**Patton Electronics** warrants all Model 2110 components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of the shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not performs as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

**Note** Conformity documents of all Patton products can be viewed online at www.patton.com under the appropriate product page.

### 1.1 COMPLIANCE

**EMC Compliance:**

- FCC Part 15, Class A
- EN55022, Class A
- EN55024

**Safety Compliance:**

- IEC/EN 60950-1

**PSTN Compliance:**

**Note** This device is not intended nor approved for connection to the PSTN.

## 1.2 RADIO AND TV INTERFERENCE (FCC PART 15)

This equipment generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the equipment causes interference to radio or television reception, which can be determined by disconnecting the cables, try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, reorienting the receiving antenna, and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

## 1.3 CE DECLARATION OF CONFORMITY

We certify that the apparatus described above conforms to the requirements of Council Directive 2004/108/EC on the approximation of the laws of the member states relating to electromagnetic compatibility; and Council Directive 2006/95/EC on the approximation of the laws of the member states relating to electrical equipment designed for use within certain voltage limits.

The safety advice in the documentation accompanying this product shall be obeyed. The conformity to the above directive is indicated by the CE sign on the device.

## 1.4 AUTHORIZED EUROPEAN REPRESENTATIVE

D R M Green
European Compliance Services Limited.
Avalon House, Marcham Road
Abingdon,
Oxon  OX14 1UD, UK

## 1.5 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Services at:

- Tel: **+1 (301) 975-1007**
- Email: **support@patton.com**
- URL: **http://www.patton.com**

**Note** Packages received without an RMA number will not be accepted.

## 1.6 SAFETY WHEN WORKING WITH ELECTRICITY

**• This device contains no user serviceable parts. The equipment shall be returned to Patton Electronics for repairs, or repaired by qualified service personnel.**

**• For units with an external power adapter, the adapter shall be a listed Limited Power Source (LPS). The power cable used shall meet all applicable standards for the country in which it is to be installed.**

**• Hazardous network voltages are present in WAN ports regardless of whether power to the unit is ON or OFF. To avoid electric shock, use caution when near WAN ports. When detaching the cables, detach the end away from the device first.**

**• Do not work on the system or connect or disconnect cables during periods of lightning activity.**

**In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.**

## 2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for one year for parts and labor. If any questions or problems arise during installation or use of this product, contact Patton Electronics Technical Support at +1 (301) 975-1007.

### 2.1 FEATURES

- PoE Ethernet Booster - No configuration necessary
- Plug ‘n Play
- Auto-MDIX Ethernet
- 10/100, Full/Half Duplex Ethernet
- Extends network connections and delivers power to an end device
- LED indicators for Power, Input Link/Activity and PoE Link
- Made in the USA

### 2.2 DESCRIPTION

The Patton Electronics Model 2110 is a Power-over-Ethernet (PoE), IEEE 802.3af Ethernet booster. Standard Ethernet is limited to 100 meter lengths over CAT5 twisted pair cable. Multiple 2110s overcome this distance while delivering power to an end device without the use of many wall adapters at each unit location.The 2110 exists in three versions:

- 2110/P – PoE Ethernet Booster
- 2110/PSE/EUI-48 – PoE Injector/ Ethernet Booster, 48VDC, 500m
- 2110/EUI – Ethernet Booster without PoE

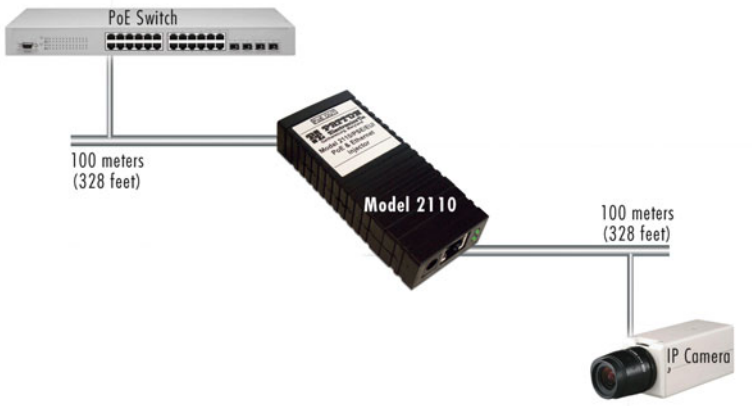


**Figure 1.** Typical application

When using a Model 2110, in conjunction with a PoE Switch, the user extends the 802.3af PoE and 10/100 Ethernet an additional 100 meters (328ft). POE-enabled IP Cameras can be placed 200 feet away from the Ethernet switch and can be powered up via PoE by the 2110. (See Appendix A.6 on page 11 for power and distance specifications).

## 3.0 INSTALLATION

CAUTION

**If used externally, interconnecting cables shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.**

To install the 2110 PoE Booster, do the following:

1. Connect the Ethernet interface (refer to section 3.1, “Connecting the POE and 10/100Base-T Ethernet Interface” on page 8).

2. EUI Models only: Connect the power plug (refer to section 3.2, “Connecting Power (EUI Models)” on page 9).

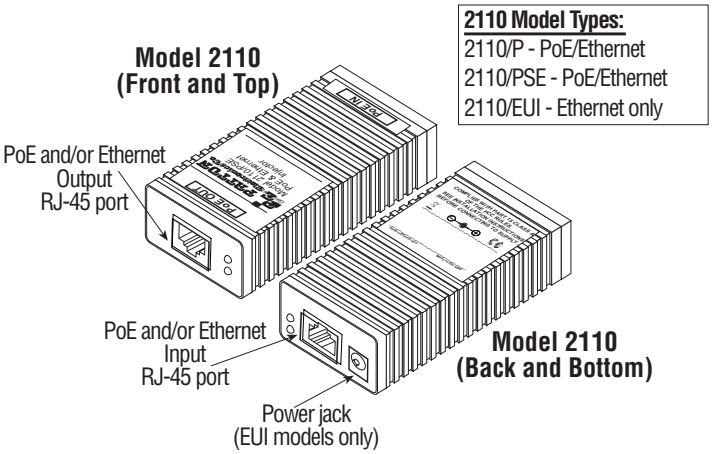


**Figure 2.** Model diagram (2110/PSE model shown)

## 3.1 CONNECTING THE POE AND 10/100BASE-T ETHERNET INTERFACE

CAUTION

**If used externally, interconnecting cables shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.**

The shielded RJ-45 port is the Auto-MDIX10/100Base-T interface. This port is designed to connect directly to a 10/100Base-T network. Figure 3 shows the signal/pin relationships on this interface. You may connect this port to a switch, IP camera, hub or PC using a straight through or crossover cable that is up to 328 ft long.

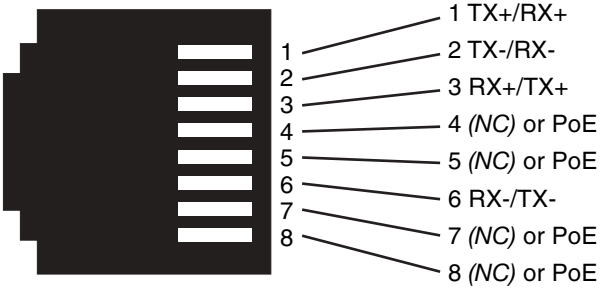


**Figure 3.** Model 2110 10/100Base-T RJ-45 Connector Pinout.

The 2110/P, 2110/PSE/EUI-48, and 2110/PSE/EUI inject power on the data pair pins 1/ 2 (POE+) and 3/ 6 (POE-) of the connector labeled “PoE OUT.” The 2110/P accepts POE power on either pin pairs 1/ 2 and 3/ 4, or 4/ 5 and 7/ 8 on the connector labeled “PoE IN.”

**Note** The POE power on the 2110/P is rectified and thus polarity of the power is irrelevant.

### 3.2 CONNECTING POWER (EUI MODELS)

**The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.**

The Model 2110 does not have a power switch, so it powers up as soon as it is plugged in.

An external AC or DC power supply may be included and must be a Limited Power Source (LPS). This connection is made via the barrel jack on the bottom panel of the Model 2110. No configuration is necessary for the power supply (See Appendix A.3 on page 11 and Appendix B on page 12 for Model 2110 power supply and cord options). The center pin is positive. The barrel type plug has a 2.5/5.5/10mm I.D./O.D./Shaft Length dimensions.

## 4.0 OPERATION

Once the Model 2110 is properly installed, it should operate transparently. No user settings required.

### 4.1 POWER UP

**Models 2110/PSE and 2110/EUI:** Before applying power to the Model 2110, please review section 3.2, “Connecting Power (EUI Models)” on page 9 to verify that the unit is connected to the appropriate power source.

## 4.2 LED STATUS MONITORS

The Model 2110 features two top panel LEDs that monitor PoE output and Ethernet activity, and two bottom panel LEDs that monitor power input and Ethernet activity. Figure  shows the locations of each LED. Table 1 describes the LED functions.

**Table 1:** LED descriptions

| LED | | Description |
|---|---|---|
| **PoE OUT (Top Panel)** | PoE Link* | Indicates link with down-stream PoE device. (Not present on 2110/EUI) |
| | Link/Act | Indicates link and activity on output port. |
| **Ethernet IN (Bottom Panel)** | Power* | Indicates 2110 is receiving power from up-stream PoE device or power adapter. |
| | Link/Act | Indicates link and activity on input port. |

* = applies to 2110/P and 2110/PSE models only

## APPENDIX A
SPECIFICATIONS

### A.1 ETHERNET CONNECTION

- Two Ethernet ports 10/100BaseTX; 802.3af
- Auto-Negotiating 10/100
- Supports Flow Control (IEEE803.X) for full duplex operation
- Supports back pressure for half duplex operation
- Store and forward
- Auto MDI-X
- 802.3af pass through

### A.2 LED STATUS INDICATORS

- PoE/Power (Green): Glows solid when there is power to the unit
- Ethernet (Green): Flashes when passing traffic

**Note** See Table 1 on page 10 for LED details.

### A.3 POWER

| Model | Voltage | Current |
|---|---|---|
| **2110/EUI** | 12VDC | 200mA |
| **2110/PSE/EUI-48** | 48VDC | 500mA |
| **2110/PSE/EUI** | 57VDC | 350mA |

### A.4 OPERATING TEMPERATURE

- 0-50°C

### A.5 OPERATING HUMIDITY

Up to 90% non-condensing

### A.6 POWER VS. DISTANCE

| Device Power (MAX) | 13W (CLASS 3/0) | 6.5W (CLASS 2) | 3.84W (CLASS 1) | 0W (NO PoE LOAD) |
|---|---|---|---|---|
| PoE Switch Range (2110/EUI) | N/A | 300m (948ft) | 400m (1310ft) | 600m (1969ft) |
| 48V Range (2110/PSE/EUI-48) | 300m (948ft) | 400m (1310ft) | 500m (1640ft) | 600m (1969ft) |
| 57V Range (2110/PSE/EUI) | 400m (1310ft) | 500m (1640ft) | 600m (1969ft) | 800m (2625ft) |

## APPENDIX B

MODEL 2110 SERIES FACTORY
REPLACEMENT PARTS AND ACCESSORIES

| Patton Model # | Description |
|---|---|
| **Base Models** | |
| 2110/P | 10/100 Ethernet Booster; 802.3af; 0-50°C |
| 2110/PSE/EUI-48 | 10/100 Ethernet Booster/PoE Injector; 802.3af; 0-50ºC, 48VDC |
| 2110/EUI | 10/100 Ethernet Booster; External 100-240VAC; 0-50°C |
| 07M2110-UM | User Manual |
| **Power Supplies** | |
| 08055-2110-I | 10/100 Ethernet Injector; External 100-240VAC; 0-50°C |
| 080511-06 | 12V Adapter, 1.25A |
| 080511-07M | 48V Adapter, 0.625A |
| **Power Cords*** | |
| 0805US | American Power Cord |
| 0805EUR | European Power Cord CEE 7 |
| 0805UK | United Kingdom Power Cord |
| 0805AUS | Australian Power Cord |
| 0805DEN | Denmark Power Cord |
| 0805FR | France/Belgium Power Cord |
| 0805IN | India Power Cord |
| 0805IS | Israel Power Cord |
| 0805JAP | Japan Power Cord |
| 0805SW | Switzerland Power Cord |

*Only required with optional UI power supply (08055DCUI)

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